

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2008-_____

MONITORING AND REPORTING PROGRAM
FOR
NORCAL WASTE SYSTEMS HAY ROAD LANDFILL, INCORPORATED
HAY ROAD LANDFILL
CLASS II & III LANDFILLS, CLASS II WASTE PILE, AND
CLASS II LAND TREATMENT UNIT
OPERATION, CLOSURE, POST-CLOSURE MAINTENANCE,
AND CORRECTIVE ACTION
SOLANO COUNTY

The Discharger shall comply with this Monitoring and Reporting Program, with Title 27, California Code of Regulations, Section 20005, et seq. (hereafter Title 27), and with the *Standard Provisions and Reporting Requirements for Waste Discharge Requirements for Nonhazardous Solid Waste Discharges Regulated by Title 27 and/or Subtitle D (27 CCR §20005 et seq. and 40 CFR 258)*, dated April 2000, as ordered by Waste Discharge Requirements Order No. R5-2008-_____.

A. REQUIRED MONITORING REPORTS

<u>Report</u>	<u>Due</u>
1. Groundwater Monitoring (Section D.1)	See Tables I-A, I-B, I-C
2. Unsaturated Zone Monitoring (Section D.2)	See Tables II-A, II-B, II-C-1, II-C-2
3. Landfill Gas Monitoring (Section D.3)	See Table III
4. Leachate Monitoring/Seeps (Section D.4)	See Tables IV-A, IV-B
5. Leak Detection Monitoring (Section D.5)	See Table V
6. Surface Water Monitoring (Section D.6)	See Table VI
7. Storm Water Monitoring (Section D.7)	As necessary
8. Semi-solid Waste Monitoring (Section D.8)	See Table VII
9. Composting Area Pond Monitoring (Section D.9)	See Table VIII
10. Facility Monitoring (Section D.10)	As necessary
11. Annual Monitoring Summary Report (Section E.5)	Annually

12. Response to a Release **As necessary**
(Standard Provisions and Reporting Requirements)

B. REPORTING

The Discharger shall submit semiannual monitoring reports with the data and information required in this Monitoring and Reporting Program and as required in Order No. R5-2008-____ and the Standard Provisions and Reporting Requirements, April 2000. Reports which do not comply with the required format will be **REJECTED** and the Discharger shall be deemed to be in noncompliance with the waste discharge requirements. In reporting the monitoring data required by this program, the Discharger shall arrange the data in tabular form so that the date, the constituents, the concentrations, and the units are readily discernible. The data shall be summarized in such a manner so as to illustrate clearly the compliance with waste discharge requirements or the lack thereof. Data shall also be submitted in a digital format acceptable to the Executive Officer.

Each monitoring report shall include a compliance evaluation summary as specified in Section E.3, below.

Field and laboratory tests shall be reported in each monitoring report. Monthly, quarterly, semiannual, and annual monitoring reports shall be submitted to the Regional Water Board in accordance with the following schedule for the calendar period in which samples were taken or observations made.

<u>Sampling Frequency</u>	<u>Reporting Frequency</u>	<u>Reporting Periods End</u>	<u>Report Date Due</u>
Monthly	Semiannually	Last Day of Month	by Semiannual Schedule
Quarterly	Semiannually	30 June 31 December	by Semiannual Schedule by Semiannual Schedule
Semiannually	Semiannually	30 June 31 December	31 July 31 January
Annually	Annually	31 December	31 January
5-Year*	Every 5 years	31 December	31 January

* Last 5-year sampling was completed in 2005

The Discharger shall submit an **Annual Monitoring Summary Report** to the Regional Water Board covering the previous monitoring year. The annual report shall contain the information specified in E. Reporting Requirements, below, and a discussion of compliance with the waste discharge requirements and the Water Quality Protection Standard.

The results of **all monitoring** conducted at the site shall be reported to the Regional Water Board in accordance with the reporting schedule above for the calendar period in which samples were taken or observations made.

C. WATER QUALITY PROTECTION STANDARD AND COMPLIANCE PERIOD

1. Water Quality Protection Standard Report

For each waste management unit (Unit), the Water Quality Protection Standard shall consist of all constituents of concern, the concentration limit for each constituent of concern, the point of compliance, and all water quality monitoring points for each monitored medium.

The Water Quality Protection Standard for naturally occurring waste constituents consists of the constituents of concern, the concentration limits, and the point of compliance and all monitoring points. The Water Quality Protection Standard, or any modification thereto, shall be submitted in a report for review and approval.

The report shall:

- a. Identify **all distinct bodies of surface and ground water** that could be affected in the event of a release from a Unit or portion of a Unit. This list shall include at least the uppermost aquifer and any permanent or ephemeral zones of perched groundwater underlying the facility.
- b. Include a map showing the monitoring points and background monitoring points for the surface water monitoring program, groundwater monitoring program, and the unsaturated zone monitoring program. The map shall include the point of compliance in accordance with §20405 of Title 27.
- c. Evaluate the perennial direction(s) of groundwater movement within the uppermost groundwater zone(s).

The Water Quality Protection Standard shall be certified by a California-registered civil engineer or geologist as meeting the requirements of Title 27. If subsequent sampling of the background monitoring point(s) indicates significant water quality changes due to either seasonal fluctuations or other reasons unrelated to waste management activities at the site, the Discharger may request modification of the Water Quality Protection Standard.

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2. Constituents of Concern

The constituents of concern include all the waste constituents, their reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in the Unit. The constituents of concern for all Units at the facility are those listed in Tables I through VI for the specified monitored medium, and Table X. The Discharger shall monitor all constituents of concern every five years, or more frequently as required.

The last 5-year Constituent-of-Concern (COC) monitoring event was conducted during 2005; therefore, the next COC event is scheduled to take place in 2010. The Discharger shall monitor all constituents of concern every five years, or more frequently as required in accordance with a Corrective Action Program.

a. Monitoring Parameters

Monitoring parameters are constituents of concern that are the waste constituents, reaction products, hazardous constituents, and physical parameters that provide a reliable indication of a release from a Unit. The monitoring parameters for all Units are those listed in Tables I through VI for the specified monitored medium.

3. Concentration Limits

For a naturally occurring constituent of concern, the detection monitoring and corrective action concentration limit for each constituent of concern shall be determined as follows:

- a. By calculation in accordance with a statistical method pursuant to §20415(e)(8) of Title 27; or
- b. By an alternate statistical method meeting the requirements of §20415(e)(8)(E) of Title 27.
- c. Concentration limits greater than background (CLGB) for corrective action may be proposed by the discharger in accordance with §20430 of Title 27 if, after proposed corrective action measures reveal that it is technically and economically infeasible to achieve background levels.

The Discharger shall establish concentration limits for the following monitored mediums as follows:

1. Unsaturated Zone – With the exception of VOCs and certain biosolids monitoring parameters (for which a non-statistical method is used to determine concentration limits), the concentration limits for COCs in the

unsaturated zone shall be based on statistical evaluation of historical monitoring data for each monitoring point, as proposed by the Discharger. These concentration limits shall be updated semi-annually and included in each monitoring report.

2. Groundwater - With the exception of VOCs (for which a non-statistical method is used to determine concentration limits), the concentration limits for groundwater monitoring shall be based on a statistical evaluation of detection monitoring data.
 - a. Western Portion of Site (Intrawell) - The Discharger conducts detection monitoring using the method of intrawell comparisons on the western portion of the site where the groundwater gradient is influenced by borrow pit pumping. The Discharger's concentration limits for the monitoring wells in this area are based on historical water quality data of each well rather than up gradient wells.
 - b. Eastern Portion of Site (Interwell) - For the eastern portion of the site, where the regional gradient prevails, the Discharger conducts detection monitoring using an interwell approach. Under this approach, concentration limits will be developed from a statistical evaluation of up gradient well data.
3. Surface Water - As proposed by the Discharger (per 29 November 2000 letter responding to staff comments on Joint Technical Document), with the exception of VOCs, the concentration limits for surface water monitoring shall be based on historical water quality data at each upstream monitoring point, but shall take into consideration seasonality. Concentration limits for VOCs will be non-statistical.

4. Point of Compliance

The point of compliance for the water standard at each Unit or portion of a Unit is a vertical surface located at the hydraulically down-gradient limit of the Unit that extends through the uppermost aquifer underlying the Unit. All point of compliance monitoring wells established for the detection monitoring program shall constitute the monitoring points for the groundwater Water Quality Protection Standard.

5. Compliance Period

The compliance period for each Unit shall be the number of years equal to the active life of the Unit plus the post-closure period. The compliance period is the minimum period during which the Discharger shall conduct a water quality monitoring program subsequent to a release from the Unit. The compliance

period shall begin anew each time the Discharger initiates an evaluation monitoring program.

D. MONITORING

The Discharger shall comply with the detection monitoring program provisions of Title 27 CCR for groundwater, surface water, and the unsaturated zone, in accordance with Detection Monitoring Specification E.2 and E.4 of Waste Discharge Requirements, Order No. R5-2008-____. Detection monitoring for a new Unit shall be installed, operational, and one year of monitoring data collected **prior to** the discharge of wastes. All monitoring shall be conducted in accordance with a Sample Collection and Analysis Plan, which includes quality assurance/quality control standards, that shall be submitted for review and approval.

All point of compliance monitoring wells established for the detection monitoring program shall constitute the monitoring points for the groundwater Water Quality Protection Standard. All detection monitoring and corrective action monitoring program groundwater monitoring wells, unsaturated zone monitoring devices, leachate, and surface water monitoring points shall be sampled and analyzed for monitoring parameters and constituents of concern as indicated and listed in Tables I through VI, and Table X.

Method detection limits and practical quantitation limits shall be reported. All peaks shall be reported, including those which cannot be quantified and/or specifically identified. Metals shall be analyzed in accordance with the methods listed in Table X.

The Discharger may use alternative analytical test methods, including new USEPA approved methods, provided the methods have method detection limits equal to or lower than the analytical methods specified in this Monitoring and Reporting Program.

For any given monitored medium, a sufficient number of samples shall be taken from all Monitoring Points and Background Monitoring Points to satisfy the data analysis requirements for a given Reporting Period, and shall be taken in a manner that ensures sample independence to the greatest extent feasible. Collection of samples shall be in accordance with procedures set forth in the Sampling and Analysis Plan (SAP) and summarized in the Annual Monitoring. The revised SAP dated April 2002 was approved by Regional Water Board staff on 6 May 2002. The SAP included a Regional Water Board-approved statistical (or non-statistical) procedure to determine whether there has been a measurably significant increase in a constituent over the water quality protection standard, as set forth in Title 27 CCR Section 20415(e)(7).

1. Groundwater

The Discharger shall operate and maintain a groundwater detection monitoring system that complies with the applicable provisions of Title 27 CCR Sections 20415 and 20420 in accordance with an approved Detection Monitoring

Program. The detection monitoring system shall be certified by a California-licensed professional civil engineer or geologist as meeting the requirements of Title 27. The Discharger shall collect, preserve, and transport groundwater samples in accordance with an approved Sampling and Analysis Plan.

The current groundwater monitoring program (Attachment B) distinguishes between wells on the western half of the site where the groundwater gradient direction is controlled by pumping from the borrow pit, and wells on the eastern half of the site where the natural gradient prevails.

Groundwater beneath the western portion of the site, which consists of modules DM-1, DM-2.2, DM-2.1, DM-11.1, and DM-11.2, is analyzed using the method of "intra-well" comparisons where each well operates as its own background well. Western area monitoring wells include G-1, G-2, G-6, G-8, G-10R (G-10 if water is present), G-11R (G-11 if water is present), G-12, G-13, 4B, P-1 (replaced damaged MW-3), and MW-4. Samples from the western portion of the site shall be collected and analyzed for the monitoring parameters in accordance with the methods and frequency specified in Table I-A.

The "interwell" approach is used on the eastern portion of the site, including WP-9.1, the LTU, DM-4.1, and DM-5, with background wells installed along the northern periphery of the landfill and detection wells installed immediately downgradient of each landfill module. Eastern area monitoring wells include background wells G-4, G-6, G-17, and G-18, and down-gradient wells G-14, G-15, G-16, G-19, G-20, G-21, and G-25. Samples from the eastern portion of the site shall be collected and analyzed for the monitoring parameters in accordance with the methods and frequency specified in Table I-B.

Monitoring well G-21 is currently in corrective action due to a release from WP-9.1. The Discharger installed a new groundwater extraction well (G-22) approximately 10 feet downgradient of G-21 to remove the impacted groundwater. To address the effectiveness of the groundwater extraction on the next deeper sand layer, a new groundwater monitoring well (G-23) was installed adjacent to well G-21. To address the effectiveness of groundwater extraction near the down-gradient limit, one new monitoring well (G-24) was installed approximately 200 feet downgradient of well G-21. Monitoring wells G-21, G-23, G-24, and extraction well G-22 shall be analyzed for the listed constituents in accordance with the methods and frequency specified in Table I-C. G-21 shall also be monitored semi-annually for the eastern area routine detection monitoring parameters as shown in Table I-B.

As the landfill expands, additional detection monitoring shall be installed at the approximate locations near the boundaries of the landfill. In addition, interim monitoring wells shall be installed and monitored to provide the earliest possible detection of a release to groundwater. The wells may be considered interim because they may be located within the permitted landfill footprint. As new

landfill cells are constructed, the wells shall be properly destroyed prior to landfill cell construction following approval.

The Discharger shall determine the groundwater flow rate and direction in the uppermost aquifer and in any zones of perched water and in any additional zone of saturation monitored pursuant to this Monitoring and Reporting Program, and report the results semi-annually, including the times of highest and lowest elevations of the water levels in the wells.

The Discharger shall determine the separation of groundwater from the lowest point of each unit and/or module.

Hydrographs of each well shall be submitted showing the elevation of groundwater with respect to the elevations of the top and bottom of the screened interval and the elevation of the pump intake. Hydrographs of each well shall be prepared quarterly and submitted annually.

Groundwater samples shall be collected from the point-of-compliance wells, background wells, and any additional wells added as part of the approved groundwater monitoring system. Samples shall be collected and analyzed for the monitoring parameters in accordance with the methods and frequency specified in Tables I-A, I-B, and I-C.

The monitoring parameters shall also be evaluated each reporting period with regards to the cation/anion balance, and the results shall be graphically presented using a Stiff diagram, a Piper graph, or a Schueller plot. Concentration limits are not required for calcium, magnesium, potassium and sodium.

The last 5-year Constituent-of-Concern (COC) groundwater monitoring event was conducted during 2005; therefore, the next COC event is scheduled to take place in 2010. Samples for the constituents of concern specified in Tables I-A, I-B and I-C shall be collected and analyzed in accordance with the methods listed in Table X.

Borrow Pit Pumping

- a. Water quality monitoring of extracted groundwater shall be conducted pursuant to applicable WDRs for land or surface water discharge. A National Pollution Discharge Elimination System (NPDES) Permit would be required for discharge to surface waters.
- b. The borrow pit pump shall be automated and equipped with a meter which continuously records flows. Procedures for maintenance of the pumps shall be included in and implemented per the Operation and Maintenance Plan developed for leachate monitoring.

- c. The Discharger shall calculate monthly volumes of groundwater extracted from the borrow pit and include this information in the Semi-annual monitoring reports.

2. Unsaturated Zone Monitoring

The Discharger shall operate and maintain an unsaturated zone detection monitoring system that complies with the applicable provisions of Title 27 CCR Sections 20415 and 20420 in accordance with an approved Detection Monitoring Program. The Discharger shall collect, preserve, and transport samples in accordance with the quality assurance/quality control standards contained in an approved Sample Collection and Analysis Plan.

Unsaturated zone samples shall be collected from the monitoring devices of the approved unsaturated zone monitoring system (Attachment B). There is no unsaturated zone monitoring system for DM-1. There is one suction lysimeter, VZ-2.1, which monitors below DM-2.1. The remaining modules and waste pile have pan lysimeters, PL-2.2A, PL-2.2B, PL-11.1, PL-11.2, PL-5.1, PL-5.2, PL-4.1, PL-9.1A (waste pile), and PL-9.1B (waste pile). These pan lysimeters provide monitoring access to the secondary drainage layer (capillary break) under the corresponding disposal modules. PL-9.1A, PL-9.1B, PL-11.1, and PL-11.2 are in corrective action.

Future expansion modules will be equipped with a leak detection zone that will be monitored as described in D.5, below.

The collected samples shall be analyzed for the listed constituents in accordance with the methods and frequency specified in Tables II-A and II-B. All monitoring parameters shall be graphed so as to show historical trends at each monitoring point. Samples for the constituents of concern specified in Tables II-A and II-B shall be collected and analyzed in accordance with the methods listed in Table X every five years.

Pan lysimeters shall be checked **monthly** for liquid and monitoring shall also include the total volume of liquid removed from the system, except for pan lysimeters in corrective action monitoring. Pan lysimeters in corrective action shall be monitored **daily or weekly** and shall also include the total volume of liquid removed from the system. Any liquid detected in a previously dry pan lysimeter shall be sampled immediately in accordance with Detection Monitoring Specifications E.21.b.

Unsaturated zone monitoring reports shall be included with the corresponding semi-annual groundwater monitoring and shall include an evaluation of potential

impacts of the facility on the unsaturated zone and compliance with the Water Quality Protection Standard.

The last 5-year Constituent-of-Concern (COC) unsaturated zone monitoring event was conducted during 2005; therefore, the next COC event is scheduled to take place in 2010.

Land Treatment Unit (LTU)

Unsaturated zone monitoring of the LTU shall be conducted in accordance with Title 27 CCR Section 20435 at locations UZ-1 through UZ-16. LTU monitoring will be conducted by installing one soil boring per acre of the (16-acre) LTU area. Background borings to be installed at the beginning of the drying season (prior to application of sludge). Detection borings to be installed at end of drying season (after sludge is removed) immediately beneath the treatment zone (no deeper than 6 feet below ground surface due to the location of groundwater – 14 May 2003 LTU re-sample report). Samples shall be analyzed in accordance with Tables II-C-1 and II-C-2.

3. Landfill Gas Monitoring

Landfill gas samples shall be also collected from all pan lysimeters and gas probes (Attachment B) on a semi-annual basis as a part of the unsaturated zone landfill gas detection monitoring program and monitored for methane, carbon dioxide, oxygen content and organic vapors using field instruments (Table III). Probes to be monitored include GP-1, GP-2, GP-3, GP-4, GP-5, GP-6, GP-7, and GP-8. Pan lysimeters include PL-2.2A, PL-2.2B, PL-4.1, PL-5.1A, PL-5.1B, PL-11.1, and PL-11.2.

If the photoionization detector indicates the presence of organic vapors in a monitoring probe or pan lysimeter, then a gas sample shall be obtained and analyzed for VOCs using EPA Method TO-15. The Discharger shall conduct verification testing (see Detection Monitoring Specification E.21.b in WDRs Order No. R5-2008-____) if the data meet either of the trigger conditions of Detection Monitoring Specifications E.21. in WDRs Order No. R5-2008-____, to determine whether a release of VOCs has occurred.

4. Leachate Monitoring/Seeps

All Unit leachate collection and removal system sumps and leachate monitoring wells shall be inspected **monthly** for leachate generation. Upon detection of leachate in a previously dry leachate collection and removal system, leachate shall be sampled **immediately** and analyzed for the constituents listed in Table IV-A (landfill) or IV-B (waste pile). Leachate shall then be sampled and analyzed annually during the fourth quarter thereafter, with a retest during the

following second quarter if constituents are detected that have not been previously detected. Leachate samples shall be collected and analyzed for the listed constituents in accordance with the methods and frequency specified in Table IV-A or IV-B. The constituents of concern list shall include all constituents listed in Table X. The quantity of leachate pumped from each sump shall be measured and reported monthly as Leachate Flow Rate (in gallons).

Leachate sumps for the landfill modules include S-1, S-2.1, S-2.2A, S-2.2B, S-4.1, S-5.1A, S-5.1B, S-11.1, and S-11.2. The waste pile sumps are designated S-9.1A and S-9.1B. Leachate monitoring wells for DM-1 include LW-1, LW-2, and LW-3.

Leachate which seeps to the surface from the Unit shall be sampled and analyzed for the Monitoring Parameters and Constituents of Concern listed in Table III upon detection. The quantity of leachate shall be *estimated* and reported as Leachate Flow Rate (in gallons/day). Also, refer to Section E.4, below.

5. Leak Detection Monitoring

Leak detection layer sumps in DM-4.1 and future expansion modules shall be checked **semi-annually** for the presence of liquid and the Discharger shall notify the Regional Water Board within **one week** if liquid has been observed. Liquid samples shall be analyzed for Total Dissolved Solids (TDS), chloride and bicarbonate (Table V) to determine the origin of the liquid. If sampling indicates evidence of a release, then confirmation activities described in Detection Monitoring Specifications E.21 and Title 27 Section 20420(j) shall be performed. All remaining liquid shall be pumped out of the leak detection layer within 48 hours.

The leak detection layer shall be monitored for VOCs using a portable photoionization detector (PID) and for methane on a quarterly basis. If the monitoring results in detected concentrations of 1.0 percent methane OR 1.0 parts per million by volume (ppmv) of VOCs or greater then a gas sample shall be collected from that location and analyzed for speciated VOCs by EPA Method TO-15 (Table V). The PID monitoring for VOCs shall be conducted with calibration to a hexane standard or other straight-chain, fuel-related hydrocarbon. Conversion to benzene-equivalents shall be conducted using a response factor for benzene provided by the manufacturer. Gas control measures shall be implemented for a Class II module upon the detection of gas-phase concentrations of VOCs as specified in Facility Specification C.14 of WDRs Order No. R5-2008-_____.

6. Surface Water Monitoring

The Discharger shall maintain an approved surface water detection monitoring system where appropriate that complies with the applicable provisions of Title 27 CCR Sections 20415 and 20420 in accordance with an approved

Detection Monitoring Program.

For all monitoring points assigned to surface water detection monitoring, samples shall be collected and analyzed for the monitoring parameters in accordance with the methods and frequency specified in Table VI. The surface water monitoring points shall consist of the following (at locations shown on Attachment B):

- a. Background monitoring points **SW-3** (south side of the culvert that carries the A-1 Channel under Hay Road) and **SW-4** (approximately 600 feet upstream of the landfill drainage discharge point).
- b. Discharge points **SW-5** (monitors the bird sanctuary pond), **SW-6** (monitors the A-1 Channel after the culvert where the drainage ditch from the eastern portion of the site joins the channel), and **SW-7** (monitors the A-1 Channel after the culvert from the bird sanctuary pond joins the channel).

All surface water monitoring samples shall be collected and analyzed for the constituents of concern specified in Table X every five years. All monitoring parameters shall be graphed so as to show historical trends at each sample location.

Surface water samples shall also be collected when leachate seeps are observed that may have impacted surface water quality. If leachate seeps are identified extending out of the disposal area or that potentially impact on-site drainages, those drainages shall be sampled as close to the leachate as possible.

The last 5-year Constituent-of-Concern (COC) surface water monitoring event was conducted during 2005; therefore, the next COC event is scheduled to take place in 2010.

7. Storm Water Monitoring

Storm water monitoring shall be conducted in accordance with the NPDES General Permit for Storm Water Discharges Associated with Industrial Activities (Water Quality Order No. 97-03-DWG, NPDES No. CAS000001). The Discharger shall submit a copy of the storm water Annual Report with the first semi-annual monitoring report for each year submitted under this program.

8. Semi-Solid Waste Monitoring

Semi-solid wastes discharged to the waste pile and LTU shall be monitored in accordance to the methods and frequency specified in Table VII.

9. Composting Area Pond Monitoring

The Discharger shall monitor the both the low-flow and high-flow runoff ponds for the composting area semiannually during the wet season in accordance with Table VIII.

10. Facility Monitoring

a. Facility Inspection

Annually, prior to the anticipated rainy season, but no later than **15 August**, the Discharger shall conduct an inspection of the facility. The inspection shall assess damage to the drainage control system and groundwater monitoring equipment (including wells, etc.). By **15 September of each year**, the Discharger shall submit to the Regional Water Board a Winterization Plan describing measures planned to prepare the site and conduct operations during the wet season.

Any necessary erosion control measures shall be implemented, and any necessary construction, maintenance, or repairs of precipitation and drainage control facilities shall be completed to prevent erosion or flooding of the facility and to prevent surface drainage from contacting or percolating through wastes by **15 October**. The Discharger shall submit an Annual Winterization Report (AWR) to the Regional Water Board describing the results of the inspection, implementation of the Winterization Plan, and measures taken to comply with this specification report, including photographs of the problem and the repairs. The AWR may be included in the Annual Report submitted under Monitoring and Reporting Program No. R5-2008-_____.

b. Storm Events

The Discharger shall inspect all precipitation, diversion, and drainage facilities for damage **within 7 days** following *major storm events*. Necessary interim repairs shall be completed **within 10 days** of the inspection and permanent repairs shall be completed when feasible. The Discharger shall report any damage and subsequent repairs within 45 days of completion of the repairs, including photographs of the problem and the repairs.

c. Standard Observations

Each monitoring report shall include a summary and certification of completion of all Standard Observations for the waste management unit, for the perimeter of the landfill module, and for the receiving waters. The

standard observations shall include those elements identified in Section E.3.f, below, and shall be performed at the required frequencies.

E. REPORTING REQUIREMENTS

1. The Discharger shall retain records of all monitoring information, including all calibration and maintenance records, all original strip chart recordings of continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order. Records shall be maintained throughout the life of the facility including the post closure period.

Such legible records shall show the following for each sample:

- a. Sample identification and the monitoring point or background monitoring point from which it was taken, along with the identity of the individual who obtained the sample;
 - b. Date, time, and manner of sampling;
 - c. Date and time that analyses were started and completed, and the name of the personnel and laboratory performing each analysis;
 - d. Complete procedure used, including method of preserving the sample, and the identity and volumes of reagents used;
 - e. Calculation of results; and
 - f. Results of analyses, and the MDL and PQL for each analysis.
2. A transmittal letter explaining the essential points shall accompany each report. At a minimum, the transmittal letter shall identify any violations found since the last report was submitted, and if the violations were corrected. If no violations have occurred since the last submittal, this shall be stated in the transmittal letter. The transmittal letter shall also state that a discussion of any violations found since the last report was submitted, and a description of the actions taken or planned for correcting those violations, including any references to previously submitted time schedules, is contained in the accompanying report.
 3. Each monitoring report shall include a compliance evaluation summary. The summary shall contain at least:
 - a. For each monitoring point and background monitoring point addressed by the report, a description of:
 - 1) The time of water level measurement;

- 2) The type of pump - or other device - used for purging and the elevation of the pump intake relative to the elevation of the screened interval;
 - 3) The method of purging (the pumping rate; the equipment and methods used to monitor field pH, temperature, and conductivity during purging; the calibration of the field equipment; results of the pH, temperature, conductivity, and turbidity testing; and the method of disposing of the purge water) to remove all portions of the water that was in the well bore while the sample was being taken;
 - 4) The type of pump - or other device - used for sampling, if different than the pump or device used for purging; and
 - 5) A statement that the sampling procedure was conducted in accordance with the approved Sampling and Analysis Plan.
- b. A map or aerial photograph showing the locations of observation stations, monitoring points, and background monitoring points.
 - c. For each groundwater body, a description and graphical presentation of the gradient and direction of groundwater flow under/around the Unit, and the groundwater flow rate, based upon water level elevations taken prior to the collection of the water quality data submitted in the report.
 - d. Laboratory statements of results of all analyses evaluating compliance with requirements.
 - e. An evaluation of the effectiveness of the leachate monitoring and control facilities, and of the run-off/run-on control facilities.
 - f. A summary and certification of completion of all **Standard Observations** for the Unit(s), for the perimeter of the Unit, and for the receiving waters. Standard observations for ACTIVE landfill units shall be conducted **weekly** during the wet season (1 October to 30 April) and **monthly** during the dry season (1 May to 30 September). Standard observations for INACTIVE or CLOSED landfill units shall be conducted **monthly** during the wet season (1 October to 30 April) and **quarterly** during the dry season (1 May to 30 September). Standard The Standard Observations shall include:
 - 1) For the Unit:
 - a) Evidence of ponded water at any point on the facility (show affected area on map);
 - b) Evidence of odors - presence or absence, characterization, source, and distance of travel from source; and

- c) Evidence of erosion and/or of day-lighted refuse.
- 2) Along the perimeter of the Unit:
 - a) Evidence of liquid leaving or entering the Unit, estimated size of affected area, and flow rate (show affected area on map);
 - b) Evidence of odors - presence or absence, characterization, source, and distance of travel from source; and
 - c) Evidence of erosion and/or of day-lighted refuse.
- 3) For receiving waters:
 - a) Floating and suspended materials of waste origin - presence or absence, source, and size of affected area;
 - b) Discoloration and turbidity - description of color, source, and size of affected area;
 - c) Evidence of odors - presence or absence, characterization, source, and distance of travel from source;
 - d) Evidence of water uses - presence of water-associated wildlife;
 - e) Flow rate; and
 - f) Weather conditions - wind direction and estimated velocity, total precipitation during recent days and on the day of observation.
- g. The quantity and types of wastes discharged and the locations in the Unit where waste has been placed since submittal of the last such report.
- 4. The Discharger shall report by telephone any seepage from the disposal area **immediately** after it is discovered. A written report shall be filed with the Regional Water Board **within seven days**, containing at least the following information:
 - a. A map showing the location(s) of seepage;
 - b. An estimate of the flow rate;
 - c. A description of the nature of the discharge (e.g., all pertinent observations and analyses);
 - d. Verification that samples have been submitted for analyses of the Constituents of Concern and Monitoring Parameters, and an estimated date that the results will be submitted to the Regional Water Board; and

- e. Corrective measures underway or proposed, and corresponding time schedule.
5. The Discharger shall submit an **Annual Monitoring Summary Report** to the Regional Water Board covering the reporting period of the previous monitoring year. This report shall contain:
- a. All monitoring parameters and constituents of concern shall be graphed so as to show historical trends at each monitoring point and background monitoring point, for all samples taken within at least the previous five calendar years. Each such graph shall plot the concentration of one or more constituents for the period of record for a given monitoring point or background monitoring point, at a scale appropriate to show trends or variations in water quality. The graphs shall plot each datum, rather than plotting mean values. For any given constituent or parameter, the scale for background plots shall be the same as that used to plot down-gradient data. Graphical analysis of monitoring data may be used to provide significant evidence of a release.
 - b. Unless otherwise exempted, all monitoring analytical data obtained during the previous two six-month reporting periods, shall be submitted in tabular form as well as in a digital file format. The Regional Water Board regards the submittal of data in hard copy and in digital format as "...the form necessary for..." statistical analysis [§20420(h)], in that this facilitates periodic review by the Regional Water Board.
 - c. A comprehensive discussion of the compliance record, and the result of any corrective actions taken or planned which may be needed to bring the Discharger into full compliance with the waste discharge requirements.
 - d. A map showing the area and elevations in which filling has been completed during the previous calendar year and a comparison to final closure design contours.
 - e. A written summary of the monitoring results, indicating any changes made or observed since the previous annual report.
 - f. An evaluation of the effectiveness of the leachate monitoring/control facilities, including the results of the annual testing of leachate collection and removal systems required under VIII.P of the Standard Provisions and Reporting Requirements.
6. The Discharger shall submit a report on the effectiveness of the corrective action program in accordance with Title 27 CCR Section 20430(h) to the Regional Water Board semi-annually. This report may be included in the Semi-Annual Monitoring Report submitted under Monitoring and Reporting Program No. R5-2008-____.
7. Annually, prior to the anticipated rainy season but no later than **15 October**, any necessary erosion control measures shall be implemented, and any necessary construction, maintenance, or repairs of precipitation and drainage control facilities

shall be completed to prevent erosion or flooding of the facility and to prevent surface drainage from contacting or percolating through wastes. By **15 September of each year**, the Discharger shall submit to the Board a Winterization Plan describing measures planned to prepare the site and conduct operations during the wet season. The Discharger shall submit an Annual Winterization Report (AWR) to the Regional Water Board describing implementation of the Winterization Plan and measures taken to comply with this specification. The AWR may be included in the Annual Report submitted under Monitoring and Reporting Program No. R5-2008-_____.

The Discharger shall implement the above monitoring program on the effective date of this Program.

Ordered by: _____
PAMELA C. CREEDON, Executive Officer

(Date)

WLB

TABLE I-A
GROUNDWATER MONITORING PROGRAM – WESTERN PORTION OF SITE

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
Field Parameters		
Groundwater Elevation	Ft. & hundredths, M.S.L.	Quarterly
Temperature	°C	Semi-Annual
Electrical Conductivity	µmhos/cm	Semi-Annual
pH	pH units	Semi-Annual
Turbidity	Turbidity units	Semi-Annual
Monitoring Parameters		
Total Dissolved Solids (TDS) ¹	mg/L	Semi-Annual
Chloride ¹	mg/L	Semi-Annual
Sulfate ¹	mg/L	Semi-Annual
Nitrate/nitrite as Nitrogen	mg/L	Semi-Annual
Arsenic	mg/L	Semi-Annual
Chromium	mg/L	Semi-Annual
Calcium	mg/L	Annual
Magnesium	mg/L	Annual
Potassium	mg/L	Annual
Sodium	mg/L	Annual
Carbonate ¹	mg/L	Semi-Annual
Bicarbonate ¹	mg/L	Semi-Annual
Volatile Organic Compounds (USEPA Method 8260B, see Table IX)	µg/L	Semi-Annual
Constituents of Concern (see Table X)		
Ammonia-Nitrogen	mg/L	5 years
Total Kjeldahl Nitrogen	mg/L	5 years
Phosphate	mg/L	5 years
Fecal Coliform	MPN/100 ml	5 years
Total Alkalinity	mg/L	5 years
Total Organic Carbon	mg/L	5 years
Inorganics (dissolved)	mg/L	5 years
Volatile Organic Compounds (USEPA Method 8260B, extended list)	µg/L	5 years
Semi-Volatile Organic Compounds (USEPA Method 8270C)	µg/L	5 years
Chlorophenoxy Herbicides (USEPA Method 8151A)	µg/L	5 years
Organophosphorus Compounds (USEPA Method 8141A)	µg/L	5 years
PCBs (USEPA Method 8082)	µg/L	5 years

1. These parameters have been excluded from detection monitoring in order to reduce the risk of false positive indications and to therefore increase the reliability of detecting a leachate release. They are included as supplemental parameters for water quality trend analysis.

TABLE I-B
GROUNDWATER MONITORING PROGRAM – EASTERN PORTION OF SITE

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
Field Parameters		
Groundwater Elevation	Ft. & hundredths, M.S.L.	Quarterly
Temperature	°C	Semi-Annual
Electrical Conductivity	µmhos/cm	Semi-Annual
pH	pH units	Semi-Annual
Turbidity	Turbidity units	Semi-Annual
Monitoring Parameters		
Total Dissolved Solids (TDS)	mg/L	Semi-Annual
Chloride	mg/L	Semi-Annual
Sulfate	mg/L	Semi-Annual
Nitrate/nitrite as Nitrogen	mg/L	Semi-Annual
Arsenic	mg/L	Semi-Annual
Chromium	mg/L	Semi-Annual
Lead	mg/L	Semi-Annual
Ammonia-Nitrogen	mg/L	Semi-Annual
Total Kjeldahl Nitrogen	mg/L	Semi-Annual
Calcium	mg/L	Annual
Magnesium	mg/L	Annual
Potassium	mg/L	Annual
Sodium	mg/L	Annual
Carbonate	mg/L	Semi-Annual
Bicarbonate	mg/L	Semi-Annual
Volatile Organic Compounds (USEPA Method 8260B, see Table IX)	µg/L	Semi-Annual
Constituents of Concern (see Table X)		
Phosphate	mg/L	5 years
Fecal Coliform	MPN/100 ml	5 years
Total Alkalinity	mg/L	5 years
Total Organic Carbon	mg/L	5 years
Inorganics (dissolved)	mg/L	5 years
Volatile Organic Compounds (USEPA Method 8260B, extended list)	µg/L	5 years
Semi-Volatile Organic Compounds (USEPA Method 8270C)	µg/L	5 years
Chlorophenoxy Herbicides (USEPA Method 8151A)	µg/L	5 years
Organophosphorus Compounds (USEPA Method 8141A)	µg/L	5 years
PCBs (USEPA Method 8082)	µg/L	5 years

TABLE I-C
GROUNDWATER CORRECTIVE ACTION MONITORING PROGRAM

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
Field Parameters		
Groundwater Elevation	Ft. & hundredths, M.S.L.	Quarterly
Electrical Conductivity	µmhos/cm	Quarterly
pH	pH units	Quarterly
Turbidity	Turbidity units	Quarterly
Volume Extracted ¹	gallons	Quarterly
Monitoring Parameters		
Nitrate/Nitrite as Nitrogen	mg/L	Quarterly

Notes:

1. For extraction well G-22 only.
2. Corrective action monitoring wells include G-21, G-22, G-23, and G-24.
3. G-21 shall also be monitored semi-annually for the eastern area routine detection monitoring parameters (Table I-B).

TABLE II-A

UNSATURATED ZONE DETECTION MONITORING PROGRAM - LANDFILL

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
Field Parameters		
Depth to Water	feet	Monthly ¹
Flow Rate/volume	gallons	Monthly ¹
Electrical Conductivity	µmhos/cm	Semi-Annual
pH	pH units	Semi-Annual
Monitoring Parameters		
Total Dissolved Solids (TDS)	mg/L	Semi-Annual
Chloride	mg/L	Semi-Annual
Sulfate	mg/L	Semi-Annual
Nitrate/nitrite as Nitrogen	mg/L	Semi-Annual
Calcium	mg/L	Semi-Annual
Magnesium	mg/L	Semi-Annual
Potassium	mg/L	Semi-Annual
Sodium	mg/L	Semi-Annual
Carbonate	mg/L	Semi-Annual
Bicarbonate	mg/L	Semi-Annual
Volatile Organic Compounds (USEPA Method 8260B, see Table IX)	µg/L	Semi-Annual
Constituents of Concern (see Table X)		
Ammonia – Nitrogen	mg/L	5 years
Nitrite-Nitrogen	mg/L	5 years
Total Kjeldahl Nitrogen	mg/L	5 years
Phosphate	mg/L	5 years
Fecal Coliform	MPN/100 ml	5 years
Total Alkalinity	mg/L	5 years
Total Organic Carbon	mg/L	5 years
Inorganics (dissolved)	mg/L	5 years
Phosphorus	mg/L	5 years
Volatile Organic Compounds (USEPA Method 8260B, extended list)	µg/L	5 years
Semi-Volatile Organic Compounds (USEPA Method 8270C)	µg/L	5 years
Chlorophenoxy Herbicides (USEPA Method 8151A)	µg/L	5 years
Organophosphorus Compounds (USEPA Method 8141A)	µg/L	5 years
PCBs (USEPA Method 8082)	µg/L	5 years

Note:

1. Pan lysimeters in corrective action shall be monitored weekly for these parameters.

TABLE II-B

UNSATURATED ZONE DETECTION MONITORING PROGRAM - WASTE PILE

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
Field Parameters		
Depth to Water	feet	Monthly ¹
Flow Rate/volume	gallons	Monthly ¹
Electrical Conductivity	µmhos/cm	Semi-Annual
pH	pH units	Semi-Annual
Monitoring Parameters		
Total Dissolved Solids (TDS)	mg/L	Semi-Annual
Chloride	mg/L	Semi-Annual
Sulfate	mg/L	Semi-Annual
Nitrate/nitrite as Nitrogen	mg/L	Semi-Annual
Calcium	mg/L	Semi-Annual
Magnesium	mg/L	Semi-Annual
Potassium	mg/L	Semi-Annual
Sodium	mg/L	Semi-Annual
Carbonate	mg/L	Semi-Annual
Bicarbonate	mg/L	Semi-Annual
Ammonia Nitrogen	mg/L	Semi-Annual
Nitrite - Nitrogen	mg/L	Semi-Annual
Total Kjeldahl Nitrogen	mg/L	Semi-Annual
Arsenic	µg/L	Semi-Annual
Chromium	µg/L	Semi-Annual
Lead	µg/L	Semi-Annual
Volatile Organic Compounds (USEPA Method 8260B, see Table IX)	µg/L	Semi-Annual
Constituents of Concern (see Table X)		
Phosphate	mg/L	5 years
Fecal Coliform	MPN/100 ml	5 years
Total Alkalinity	mg/L	5 years
Total Organic Carbon	mg/L	5 years
Inorganics (dissolved)	mg/L	5 years
Phosphorus	mg/L	5 years
Volatile Organic Compounds (USEPA Method 8260B, extended list)	µg/L	5 years
Semi-Volatile Organic Compounds (USEPA Method 8270C)	µg/L	5 years
Chlorophenoxy Herbicides (USEPA Method 8151A)	µg/L	5 years
Organophosphorus Compounds (USEPA Method 8141A)	µg/L	5 years
PCBs (USEPA Method 8082)	µg/L	5 years

Note.

1. Pan lysimeters in corrective action shall be monitored weekly for these parameters.

TABLE II-C-1

**UNSATURATED ZONE DETECTION MONITORING PROGRAM –
 LAND TREATMENT UNIT- Soil Pore Water¹**

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
Field Parameters		
pH	pH units	Twice per year ²
Monitoring Parameters		
Total Dissolved Solids (TDS)	mg/L	Twice per year ²
Chloride	mg/L	Twice per year ²
Sulfate	mg/L	Twice per year ²
Nitrate/nitrite as Nitrogen	mg/L	Twice per year ²
Ammonia Nitrogen	mg/L	Twice per year ²
Total Kjeldahl Nitrogen	mg/L	Twice per year ²
Arsenic	µg/L	Annual ²
Chromium	µg/L	Annual ²
Dissolved Lead	µg/L	Annual ²
Phosphate	mg/L	Annual ²
Volatile Organic Compounds (USEPA Method 8260B, see Table IX)	µg/L	Annual ²
Constituents of Concern (see Table X)		
Bicarbonate & Carbonate	mg/L	5 years
Calcium	mg/L	5 years
Magnesium	mg/L	5 years
Potassium	mg/L	5 years
Sodium	mg/L	5 years
Phosphate	mg/L	5 years
Fecal Coliform	100 MPN/ml	5 years
Total Alkalinity	mg/L	5 years
Total Organic Carbon	mg/L	5 years
Inorganics (dissolved)	mg/L	5 years
Phosphorus	mg/L	5 years
Volatile Organic Compounds (USEPA Method 8260B, extended list)	µg/L	5 years
Semi-Volatile Organic Compounds (USEPA Method 8270C)	µg/L	5 years
Chlorophenoxy Herbicides (USEPA Method 8151A)	µg/L	5 years
Organophosphorus Compounds (USEPA Method 8141A)	µg/L	5 years
PCBs (USEPA Method 8082)	µg/L	5 years

Note:

1. If pore water cannot be extracted from samples, proceed with soil analysis per Table II-C-2.
2. One sample shall be taken at each monitoring location before the drying season (prior to sludge application) and one at the end of the drying season (after sludge is removed).

TABLE II-C-2

**UNSATURATED ZONE DETECTION MONITORING PROGRAM –
 LAND TREATMENT UNIT - Soil**

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
Field Parameters		
Moisture	percent	Twice per year ¹
pH	pH units	Twice per year ¹
Monitoring Parameters		
Total Dissolved Solids (TDS)	mg/L	Twice per year ²
Chloride	mg/L	Twice per year ²
Nitrate/nitrite as Nitrogen	mg/L	Twice per year ²
Sulfate	mg/L	Twice per year ²
Ammonia Nitrogen	mg/L	Twice per year ²
Nitrite Nitrogen	mg/L	Twice per year ²
Total Kjeldahl Nitrogen	mg/L	Twice per year ²
Arsenic	µg/L	Annually ²
Chromium	µg/L	Annually ²
Dissolved Lead	µg/L	Annually ²
Constituents of Concern (see Table X)		
Bicarbonate & Carbonate	mg/L	5 years
Calcium	mg/L	5 years
Magnesium	mg/L	5 years
Potassium	mg/L	5 years
Sodium	mg/L	5 years
Phosphate	mg/L	5 years
Fecal Coliform	100 MPN/ml	5 years
Total Alkalinity	mg/L	5 years
Total Organic Carbon	mg/L	5 years
Inorganics (dissolved)	mg/L	5 years
Phosphorus	mg/L	5 years
Volatile Organic Compounds (USEPA Method 8260B, extended list)	µg/L	5 years
Semi-Volatile Organic Compounds (USEPA Method 8270C)	µg/L	5 years
Chlorophenoxy Herbicides (USEPA Method 8151A)	µg/L	5 years
Organophosphorus Compounds (USEPA Method 8141A)	µg/L	5 years
PCBs (USEPA Method 8082)	µg/L	5 years

Notes:

1. One sample shall be taken at each monitoring location before the drying season (prior to sludge application) and one at the end of the drying season (after sludge is removed).
2. Samples shall be taken at end of drying season after sludge removal immediately below the treatment zone of 5 feet but not to exceed 6 feet in depth. Monitor soil for these constituents only when pore water samples cannot be extracted from soil. Use WET test for extraction and see Table X for constituent test methods.

TABLE III
LANDFILL GAS MONITORING PROGRAM

Landfill Gas Detection Monitoring Program

Location	Landfill Gas Monitoring Parameters				VOCs By
	Methane	Carbon Dioxide	Oxygen	Organic vapors	EPA TO-15
All constructed gas probes and pan lysimeters	Semi Annual	Semi Annual	Semi Annual	Semi Annual	If detected*
<p>Legend:</p> <p>LFG Field Monitoring using GEM 500 (or approved equivalent) for LFG and portable Photo Ionization Detector (PID) Meter for VOCs. The PID shall be calibrated and results presented as benzene equivalents.</p> <p>* If the photoionization detector indicates the presence of organic vapors in a monitoring probe or pan lysimeter, then a gas sample shall be obtained and analyzed for speciated VOCs using EPA Method TO-15.</p>					

TABLE IV-A
LEACHATE DETECTION MONITORING PROGRAM - LANDFILL

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
Field Parameters		
Depth to Water	feet	Monthly ¹
Total Volume Pumped	Gallons	Monthly ¹
Flow Rate	Gallons/Day	Monthly ¹
Electrical Conductivity	µmhos/cm	Annual
pH	pH units	Annual
Monitoring Parameters		
Total Dissolved Solids (TDS)	mg/L	Annual
Chloride	mg/L	Annual
Sulfate	mg/L	Annual
Nitrate/nitrite as Nitrogen	mg/L	Annual
Volatile Organic Compounds (USEPA Method 8260B, see Table IX)	µg/L	Annual
Carbonate	mg/L	Annual
Bicarbonate	mg/L	Annual
Calcium	mg/L	Annual
Magnesium	mg/L	Annual
Potassium	mg/L	Annual
Sodium	mg/L	Annual
Phosphate	mg/L	Annual
Phosphorus	mg/L	Annual
Fecal Coliform	100 MPN/ml	Annual
Total Alkalinity	mg/L	Annual
Total Organic Carbon	mg/L	Annual
Constituents of Concern (see Table XI)		
Ammonia-Nitrogen	mg/L	5 years
Nitrite-Nitrogen	mg/L	5 years
Total Kjeldahl Nitrogen	mg/L	5 years
Inorganics (dissolved)	mg/L	5 years
Volatile Organic Compounds (USEPA Method 8260B, extended list)	µg/L	5 years
Semi-Volatile Organic Compounds (USEPA Method 8270C)	µg/L	5 years
Chlorophenoxy Herbicides (USEPA Method 8151A)	µg/L	5 years
Organophosphorus Compounds (USEPA Method 8141A)	µg/L	5 years
PCBs (USEPA Method 8082)	µg/L	5 years

Note.

1. Sumps whose pan lysimeters are in a corrective action monitoring program shall be monitored weekly.

TABLE IV-B

LEACHATE DETECTION MONITORING PROGRAM – WASTE PILE

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
Field Parameters		
Depth to Water	feet	Monthly ¹
Total Volume Pumped	Gallons	Monthly ¹
Flow Rate	Gallons/Day	Monthly
Electrical Conductivity	µmhos/cm	Annual
pH	pH units	Annual
Monitoring Parameters		
Total Dissolved Solids (TDS)	mg/L	Annual
Chloride	mg/L	Annual
Sulfate	mg/L	Annual
Nitrate/nitrite as Nitrogen	mg/L	Annual
Arsenic	mg/L	Annual
Chromium	mg/L	Annual
Lead	mg/L	Annual
Ammonia-Nitrogen	mg/L	Annual
Nitrite-Nitrogen	mg/L	Annual
Total Kjeldahl Nitrogen	mg/L	Annual
Volatile Organic Compounds (USEPA Method 8260B, see Table IX)	µg/L	Annual
Carbonate	mg/L	Annual
Bicarbonate	mg/L	Annual
Calcium	mg/L	Annual
Magnesium	mg/L	Annual
Potassium	mg/L	Annual
Sodium	mg/L	Annual
Phosphate	mg/L	Annual
Phosphorus	mg/L	Annual
Fecal Coliform	100 MPN/ml	Annual
Total Alkalinity	mg/L	Annual
Total Organic Carbon	mg/L	Annual
Constituents of Concern (see Table X)		
Inorganics (dissolved)	mg/L	5 years
Volatile Organic Compounds (USEPA Method 8260B, extended list)	µg/L	5 years
Semi-Volatile Organic Compounds (USEPA Method 8270C)	µg/L	5 years
Chlorophenoxy Herbicides (USEPA Method 8151A)	µg/L	5 years
Organophosphorus Compounds (USEPA Method 8141A)	µg/L	5 years
PCBs (USEPA Method 8082)	µg/L	5 years

Note.

1. Sumps whose pan lysimeters are in a corrective action monitoring program shall be monitored weekly for these parameters, and any time daily rainfall exceeds one inch.

TABLE V
LEAK DETECTION MONITORING
(Semi-Annual)

Location	Liquid Analysis (if present)	Gas Analysis*
All leak detection layer sumps	Total Dissolved Solids	Organic vapors using PID
	Chloride	Methane
	Bicarbonate	

- * If the monitoring results in detected concentrations of 1.0 percent methane OR 1.0 parts per million by volume (ppmv) of VOCs or greater then a gas sample shall be collected from that location and analyzed for speciated VOCs by EPA Method TO-15. The PID monitoring for VOCs shall be conducted with calibration to a hexane standard or other straight-chain, fuel-related hydrocarbon. Conversion to benzene-equivalents shall be conducted using a response factor for benzene provided by the manufacturer.

TABLE VI
SURFACE WATER DETECTION MONITORING PROGRAM

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
Field Parameters		
Turbidity	Turbidity units	Semi-Annual
Temperature	°C	Semi-Annual
Electrical Conductivity	µmhos/cm	Semi-Annual
pH	pH units	Semi-Annual
Monitoring Parameters		
Total Dissolved Solids (TDS)	mg/L	Semi-Annual
Chloride	mg/L	Semi-Annual
Sulfate	mg/L	Semi-Annual
Nitrate/nitrite as Nitrogen	mg/L	Semi-Annual
Total Suspended Solids	mg/L	Semi-Annual
Arsenic	mg/L	Semi-Annual
Chromium	mg/L	Semi-Annual
Lead	mg/L	Semi-Annual
Ammonia-Nitrogen	mg/L	Semi-Annual
Nitrite-Nitrogen	mg/L	Semi-Annual
Total Kjeldahl Nitrogen	mg/L	Semi-Annual
Volatile Organic Compounds	µg/L	Semi-Annual
(USEPA Method 8260B, see Table IX)		
Constituents of Concern (see Table X)		
Bicarbonate	mg/L	5 years
Carbonate	mg/L	5 years
Calcium	mg/L	5 years
Magnesium	mg/L	5 years
Potassium	mg/L	5 years
Sodium	mg/L	5 years
Phosphate	mg/L	5 years
Fecal Coliform	100 MPN/ml	5 years
Total Alkalinity	mg/L	5 years
Total Organic Carbon	mg/L	5 years
Phosphorus	mg/L	5 years
Inorganics (dissolved)	mg/L	5 years
Volatile Organic Compounds	µg/L	5 years
(USEPA Method 8260B, extended list)		
Semi-Volatile Organic Compounds	µg/L	5 years
(USEPA Method 8270C)		
Chlorophenoxy Herbicides	µg/L	5 years
(USEPA Method 8151A)		
Organophosphorus Compounds	µg/L	5 years
(USEPA Method 8141A)		
PCBs	µg/L	5 years
(USEPA Method 8082)		

TABLE VII
SEMISOLID WASTE MONITORING PROGRAM

Waste Pile

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
Type of material discharged	-----	Semi-Annual
Quantity discharged	cubic yards, wet tons	Semi-Annual
Moisture Content ¹	percent	Semi-Annual
Capacity of unit/module remaining	percent	Semi-Annual

1. Biosolids discharged to WP 9.1 shall not contain any free liquids per Prohibition A.16 of WDRs.

Land Treatment Unit

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
Initial sludge depth	inches and # of lifts	Monthly
Quantity discharged	cubic yards, wet tons	Monthly
Moisture Content	percent	Monthly
Location within LTU	quadrant	Monthly
Quantity removed	cubic yards, wet tons	Monthly
Moisture content	percent	Monthly
Location within LTU	quadrant	Monthly
Disposition	-----	Monthly
Final sludge depth	inches and # of lifts	Monthly
Area covered	acres	Monthly
Total drying cycles during period	-----	Monthly
Cumulative LTU area covered	acres	Monthly

TABLE VIII
COMPOSTING AREA POND MONITORING

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
Field Parameters		
Turbidity	Turbidity units	Semi-Annual ¹
Electrical Conductivity	µmhos/cm	Semi-Annual ¹
pH	pH units	Semi-Annual ¹
Monitoring Parameters		
Total Dissolved Solids (TDS)	mg/L	Semi-Annual ¹
Total Fixed Dissolved Solids (TFDS)	mg/L	Semi-Annual ¹
Chloride	mg/L	Semi-Annual ¹
Sulfate	mg/L	Semi-Annual ¹
Nitrate as Nitrogen	mg/L	Semi-Annual ¹
Ammonia as Nitrogen	mg/L	Semi-Annual ¹
Total Kjeldahl Nitrogen	mg/L	Semi-Annual ¹
Total Phosphorous	mg/L	Semi-Annual ¹
Total Lead	µg/L	Semi-Annual ¹

¹ Samples shall be collected twice annually during the wet season after the first significant storm event during the second half of the calendar year, and one other sample during the first half of the calendar year. Cumulative sample results shall be reported in each semiannual and annual report.

TABLE IX
**MONITORING PARAMETERS FOR DETECTION MONITORING &
 APPROVED USEPA ANALYTICAL METHODS**

<u>Field Parameters</u>	<u>Method</u>
Temperature	2550
Turbidity	2130B
pH	150.1
Electrical Conductivity	2510
 <u>Biosolids Parameters</u>	 <u>Method</u>
Ammonia Nitrogen	4500-NH ₃
Nitrite Nitrogen	300 (anion scan)
Total Kjeldahl Nitrogen	4500-N-org
 <u>General Minerals</u>	 <u>Method</u>
Bicarbonate	2310B
Carbonate	2310B
Calcium	300 (anion scan)
Chloride	300 (anion scan)
Magnesium	200.7 (trace method)
Nitrate – Nitrogen	300 (anion scan)
Phosphate	300 (anion scan)
Potassium	200.7 (trace method)
Sodium	200.7 (trace method)
Sulfates	300 (anion scan)
Total Dissolved Solids (TDS)	2540C
 <u>Other Parameters</u>	 <u>Method</u>
Phosphate	300 (anion scan)
 <u>Inorganics</u>¹	 <u>Method</u>
Arsenic	200.9/200.8
Lead	200.9/200.8
Chromium	200.7/6010

1. Leachate, groundwater, and unsaturated zone samples shall be analyzed and reported as dissolved.

Surrogates for Metallic Constituents:

pH
 Total Dissolved Solids
 Electrical Conductivity
 Chloride
 Sulfate
 Nitrate nitrogen

TABLE IX

**MONITORING PARAMETERS FOR DETECTION MONITORING &
APPROVED USEPA ANALYTICAL METHODS**

Continued

Constituents included in VOC:

USEPA Method 8260B

Acetone
Acrylonitrile
Tert-Amyl ethyl ether
Benzene
Bromobenzene
Bromochloromethane
Bromodichloromethane
Bromoform (Tribromomethane)
n-Butylbenzene
sec-Butylbenzene
tert-Butylbenzene
Carbon disulfide
Carbon tetrachloride
Chlorobenzene
Chloroethane (Ethyl chloride)
Chloroform (Trichloromethane)
Dibromochloromethane (Chlorodibromomethane)
1,2-Dibromo-3-chloropropane (DBCP)
1,2-Dibromoethane (Ethylene dibromide; EDB)
o-Dichlorobenzene (1,2-Dichlorobenzene)
m-Dichlorobenzene (1,3-Dichlorobenzene)
p-Dichlorobenzene (1,4-Dichlorobenzene)
trans-1,4-Dichloro-2-butene
Dichlorodifluoromethane (CFC-12)
1,1-Dichloroethane (Ethylidene chloride)
1,2-Dichloroethane (Ethylene dichloride)
1,1 -Dichloroethylene (1,1 -Dichloroethene; Vinylidene chloride)
cis- 1,2-Dichloroethylene (cis- 1,2-Dichloroethene)
trans-1,2-Dichloroethylene (trans-1,2-Dichloroethene)
1,2-Dichloropropane (Propylene dichloride)
cis- 1,3-Dichloropropene
trans- 1,3-Dichloropropene
Di-isopropylether (DIPE)
1,4 Dioxane
Ethanol
di-Isopropyl ether
Ethyltertiary butyl ether
Ethylbenzene
2-Hexanone (Methyl butyl ketone)
Hexachlorobutadiene
Hexachloroethane

TABLE IX

**MONITORING PARAMETERS FOR DETECTION MONITORING &
APPROVED USEPA ANALYTICAL METHODS**

Continued

Methyl bromide (Bromomethene)
Methyl chloride (Chloromethane)
Methylene bromide (Dibromomethane)
Methylene chloride (Dichloromethane)
Methyl ethyl ketone (MEK: 2-Butanone)
Methyl iodide (Iodomethane)
Methyl t-butyl ether (MTBE)
4-Methyl-2-pentanone (Methyl isobutylketone)
Naphthalene
2-Nitropropane
n-Propylbenzene
Styrene
Tertiary amyl methyl ether
Tertiary butyl alcohol
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrachloroethylene (Tetrachloroethene; Perchloroethylene)
Toluene
1,2,4-Trichlorobenzene
1,1,1-Trichloroethane (Methylchloroform)
1,1,2-Trichloroethane
Trichloroethylene (Trichloroethene)
Trichlorofluoromethane (CFC- 11)
1,2,3-Trichloropropane
1,2,4-Trimethylbenzene
1,3,5-Trimethylbenzene
Vinyl acetate
Vinyl chloride
Xylenes (total)

TABLE X
CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

<u>Field Parameters</u>	<u>Method</u>
pH	150.1
Electrical Conductivity	2510
<u>Biosolids Parameters</u>	<u>Method</u>
Fecal Coliform	9221B
Total Alkalinity	2310B
Ammonia Nitrogen	4500-NH ₃
Nitrite Nitrogen	300
Total Kjeldahl Nitrogen	4500-N-org
Total Organic Carbon	415.1
<u>General Minerals</u>	<u>Method</u>
Bicarbonate	2310B
Carbonate	2310B
Calcium	300 (anion scan)
Chloride	300 (anion scan)
Magnesium	200.7 (trace method)
Nitrate – Nitrogen	300 (anion scan)
Phosphate	300 (anion scan)
Potassium	200.7 (trace method)
Sodium	200.7 (trace method)
Sulfates	300 (anion scan)
Total Dissolved Solids (TDS)	2540C
<u>Inorganics (dissolved):</u>	<u>Method</u>
Aluminum	200.7/6010
Antimony	200.7/7041
Barium	200.7/6010
Beryllium	200.7/6010
Cadmium	200.7/7131A
Chromium	200.7/6010
Cobalt	200.7/6010
Copper	200.7/6010
Silver	200.7/6010
Tin	200.7/6010
Vanadium	200.7/6010
Zinc	200.7/6010
Iron	200.7/6010
Manganese	200.7/6010
Arsenic	200.9/200.8
Lead	200.9/200.8
Mercury	7470A
Nickel	200.9/200.8
Selenium	200.9/200.8

TABLE X
CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

Continued

Thallium	200.9/200.8
Cyanide	9010
Sulfide	9030

<u>Other Parameters</u>	<u>Method</u>
Phosphorus (ortho)	365.3

Volatile Organic Compounds (Method 8260B):

Acetone
 Acetonitrile (Methyl cyanide)
 Acrolein
 Acrylonitrile
 Allyl chloride (3-Chloropropene)
 Tert-Amyl ethyl ether
 Benzene
 Bromobenzene
 Bromochloromethane (Chlorobromomethane)
 Bromodichloromethane (Dibromochloromethane)
 Bromoform (Tribromomethane)
 n-Butylbenzene
 sec-Butylbenzene
 tert-Butylbenzene
 Carbon disulfide
 Carbon tetrachloride
 Chlorobenzene
 Chloroethane (Ethyl chloride)
 Chloroform (Trichloromethane)
 Chloroprene
 Dibromochloromethane (Chlorodibromomethane)
 1,2-Dibromo-3-chloropropane (DBCP)
 1,2-Dibromoethane (Ethylene dibromide; EDB)
 o-Dichlorobenzene (1,2-Dichlorobenzene)
 m-Dichlorobenzene (1,3-Dichlorobenzene)
 p-Dichlorobenzene (1,4-Dichlorobenzene)
 trans- 1,4-Dichloro-2-butene
 Dichlorodifluoromethane (CFC 12)
 1,1 -Dichloroethane (Ethylidene chloride)
 1,2-Dichloroethane (Ethylene dichloride)
 1,1 -Dichloroethylene (1, I-Dichloroethene; Vinylidene chloride)
 cis- 1,2-Dichloroethylene (cis- 1,2-Dichloroethene)
 trans- 1,2-Dichloroethylene (trans- 1,2-Dichloroethene)
 1,2-Dichloropropane (Propylene dichloride)
 1,3-Dichloropropane (Trimethylene dichloride)

TABLE X
CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS
Continued

2,2-Dichloropropane (Isopropylidene chloride)
1,1 -Dichloropropene
cis- 1,3-Dichloropropene
trans- 1,3-Dichloropropene
Di-isopropylether (DIPE)
1,4-Dioxane
Ethanol
Ethyltertiary butyl ether
Ethylbenzene
Ethyl methacrylate
Hexachlorobutadiene
Hexachloroethane
2-Hexanone (Methyl butyl ketone)
Isobutyl alcohol
Methacrylonitrile
Methyl bromide (Bromomethane)
Methyl chloride (Chloromethane)
Methyl ethyl ketone (MEK; 2-Butanone)
Methyl iodide (Iodomethane)
Methyl t-butyl ether (MTBE)
Methyl methacrylate
4-Methyl-2-pentanone (Methyl isobutyl ketone)
Methylene bromide (Dibromomethane)
Methylene chloride (Dichloromethane)
Naphthalene
2-Nitropropane
n-Propylbenzene
Propionitrile (Ethyl cyanide)
Styrene
Tertiary amyl methyl ether
Tertiary butyl alcohol
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrachloroethylene (Tetrachloroethene; Perchloroethylene; PCE)
Toluene
1,2,4-Trichlorobenzene
1,1,1 -Trichloroethane, Methylchloroform
1,1,2-Trichloroethane
Trichloroethylene (Trichloroethene; TCE)
Trichlorofluoromethane (CFC- 11)
1,2,3-Trichloropropane
1,2,4-Trimethylbenzene
1,3,5-Trimethylbenzene
Vinyl acetate

TABLE X
CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS
Continued

Vinyl chloride (Chloroethene)
Xylene (total)

Semi-Volatile Organic Compounds (Method 8270 - base, neutral, & acid extractables):

Acenaphthene
Acenaphthylene
Acetophenone
2-Acetylaminofluorene (2-AAF)
Aldrin
4-Aminobiphenyl
Anthracene
Benzo[a]anthracene (Benzanthracene)
Benzo[b]fluoranthene
Benzo[k]fluoranthene
Benzo[g,h,i]perylene
Benzo[a]pyrene
Benzyl alcohol
Bis(2-ethylhexyl) phthalate
alpha-BHC
beta-BHC
delta-BHC
gamma-BHC (Lindane)
Bis(2-chloroethoxy)methane
Bis(2-chloroethyl) ether (Dichloroethyl ether)
Bis(2-chloro-1-methylethyl) ether (Bis(2-chloroisopropyl) ether; DCIP)
4-Bromophenyl phenyl ether
Butyl benzyl phthalate (Benzyl butyl phthalate)
Chlordane
p-Chloroaniline
Chlorobenzilate
p-Chloro-m-cresol (4-Chloro-3-methylphenol)
2-Chloronaphthalene
2-Chlorophenol
4-Chlorophenyl phenyl ether
Chrysene
o-Cresol (2-methylphenol)
m-Cresol (3-methylphenol)
p-Cresol (4-methylphenol)
4,4'-DDD
4,4'-DDE
4,4'-DDT
Diallate

TABLE X
CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS
Continued

Dibenz[a,h]anthracene
Dibenzofuran
Di-n-butyl phthalate
3,3'-Dichlorobenzidine
2,4-Dichlorophenol
2,6-Dichlorophenol
Dieldrin
Diethyl phthalate
p-(Dimethylamino)azobenzene
7,12-Dimethylbenz[a]anthracene
3,3'-Dimethylbenzidine
2,4-Dimethylphenol (m-Xylenol)
Dimethyl phthalate
m-Dinitrobenzene
4,6-Dinitro-o-cresol (4,6-Dinitro-2-methylphenol)
2,4-Dinitrophenol
2,4-Dinitrotoluene
2,6-Dinitrotoluene
Di-n-octyl phthalate
Diphenylamine
Endosulfan I
Endosulfan II
Endosulfan sulfate
Endrin
Endrin aldehyde
Ethyl methanesulfonate
Famphur
Fluoranthene
Fluorene
Heptachlor
Heptachlor epoxide
Hexachlorobenzene
Hexachlorocyclopentadiene
Hexachloropropene
Indeno(1,2,3-c,d)pyrene
Isodrin
Isophorone
Isosafrole
Kepone
Methapyrilene
Methoxychlor
3-Methylcholanthrene
Methyl methanesulfonate
2-Methylnaphthalene

TABLE X
CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS
Continued

1,4-Naphthoquinone
1-Naphthylamine
2-Naphthylamine
o-Nitroaniline (2-Nitroaniline)
m-Nitroaniline (3-Nitroaniline)
p-Nitroaniline (4-Nitroaniline)
Nitrobenzene
o-Nitrophenol (2-Nitrophenol)
p-Nitrophenol (4-Nitrophenol)
N-Nitrosodi-n-butylamine (Di-n-butylNitrosamine)
N-Nitrosodiethylamine (DiethylNitrosamine)
N-Nitrosodimethylamine (DimethylNitrosamine)
N-Nitrosodiphenylamine (DiphenylNitrosamine)
N-Nitrosodipropylamine (N-Nitroso-N-dipropylamine; Di-n-propylNitrosamine)
N-Nitrosomethylethylamine (MethylethylNitrosamine)
N-Nitrosopiperidine
N-Nitrosospyrrolidine
5-Nitro-o-toluidine
Pentachlorobenzene
Pentachloronitrobenzene (PCNB)
Pentachlorophenol
Phenacetin
Phenanthrene
Phenol
p-Phenylenediamine
Polychlorinated biphenyls (PCBs; Aroclors)
Pronamide
Pyrene
Safrole
1,2,4,5-Tetrachlorobenzene
2,3,4,6-Tetrachlorophenol
o-Toluidine
Toxaphene
2,4,5-Trichlorophenol
0,0,0-Triethyl phosphorothioate
sym-Trinitrobenzene

TABLE X
CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS
Continued

Chlorophenoxy Herbicides (Method 8151A):

2,4-D (2,4-Dichlorophenoxyacetic acid)
Dinoseb (DNBP; 2-sec-Butyl-4,6-dinitrophenol)
Silvex (2,4,5-Trichlorophenoxypropionic acid; 2,4,5-TP)
2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)

Organophosphorus Compounds (Method 8141A):

Atrazine
Chlorpyrifos
0,0-Diethyl 0-2-pyrazinyl phosphorothioate (Thionazin)
Diazinon
Dimethoate
Disulfoton
Ethion
Methyl parathion (Parathion methyl)
Parathion
Phorate
Simazine